

G. Draper. Let-Off for Loom.

N^o 4,834.

Patented Mar. 8, 1864.

Fig. 6.

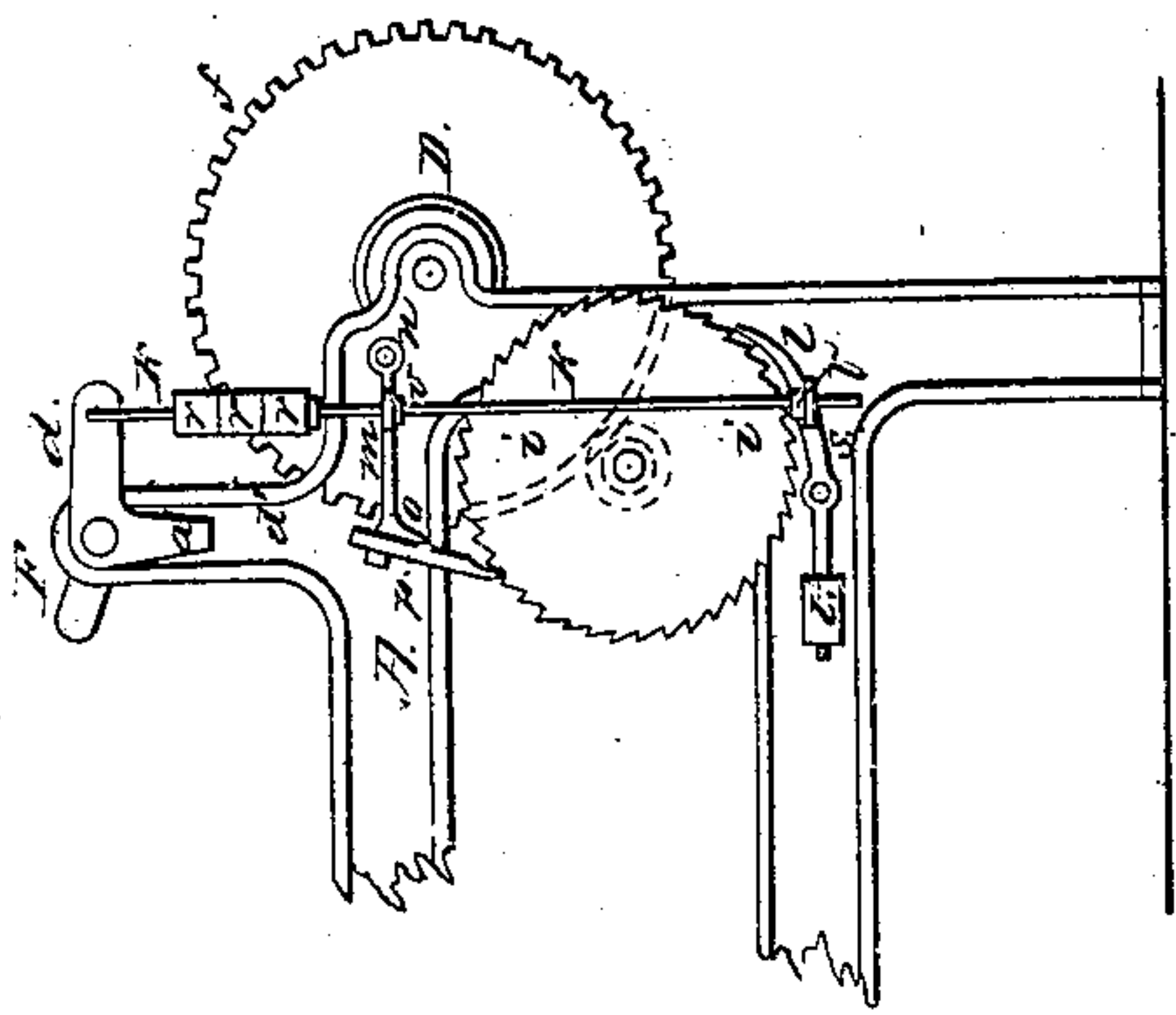


Fig. 4.

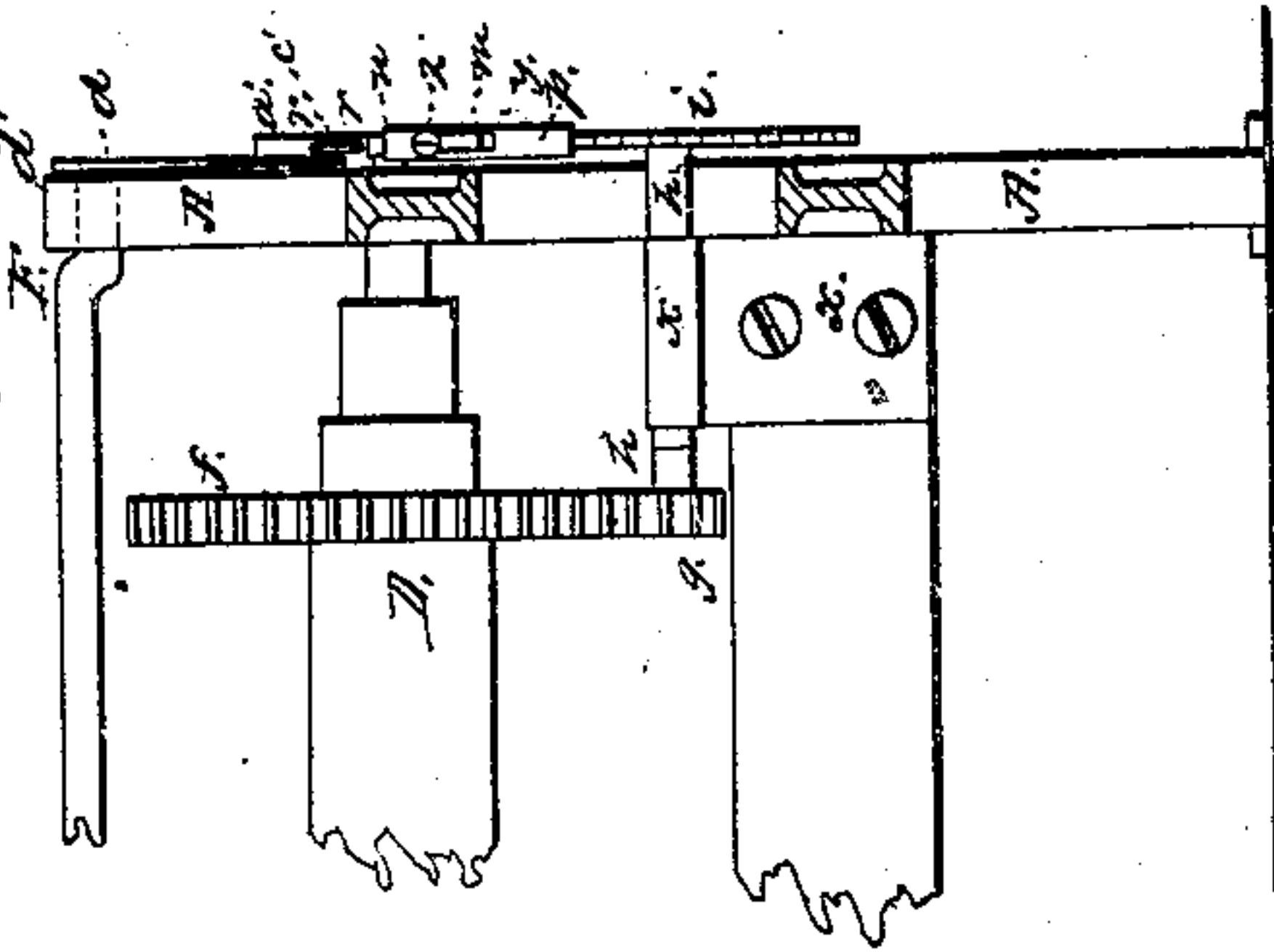


Fig. 6.



Fig. 2.

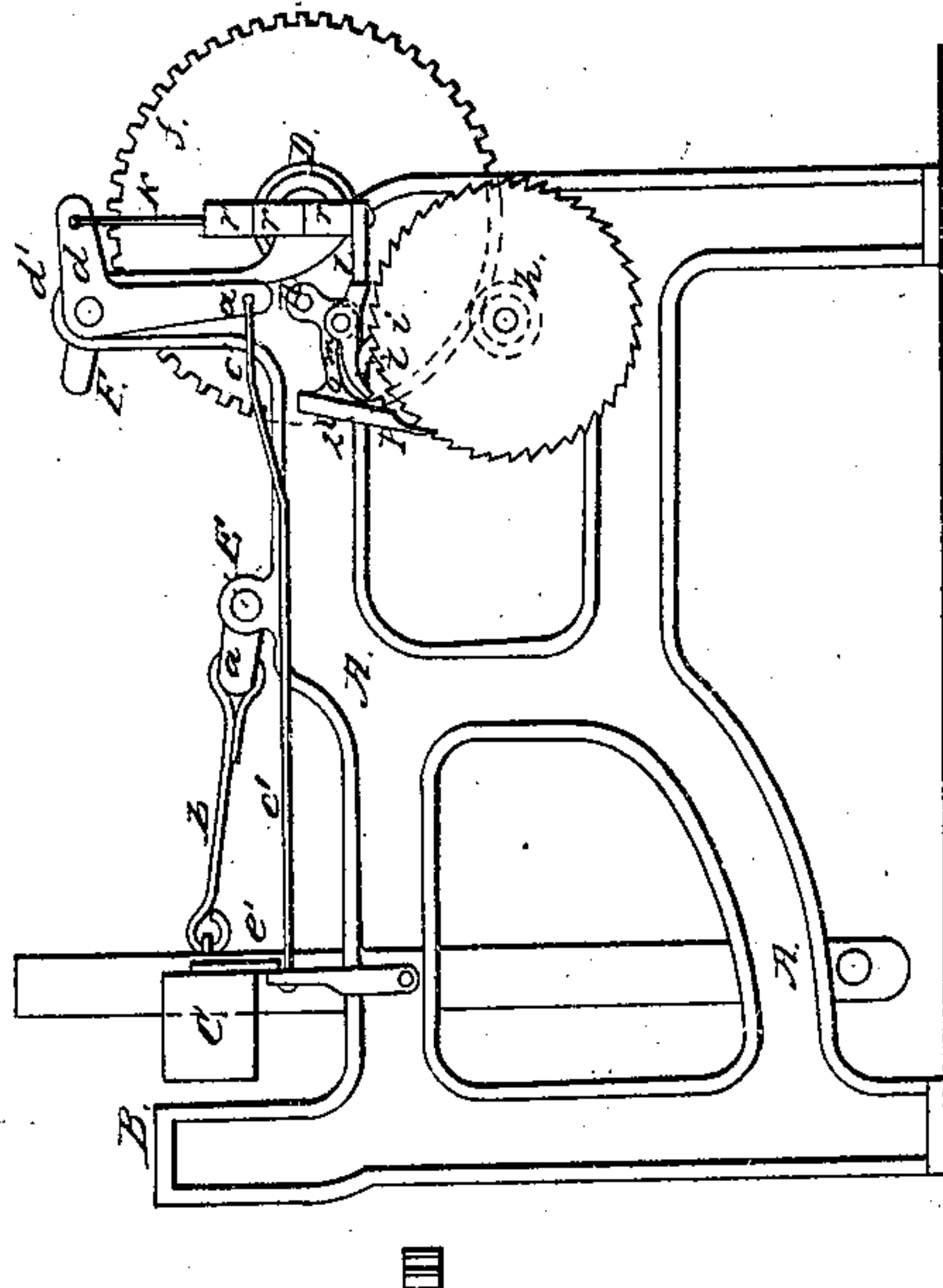


Fig. 3.

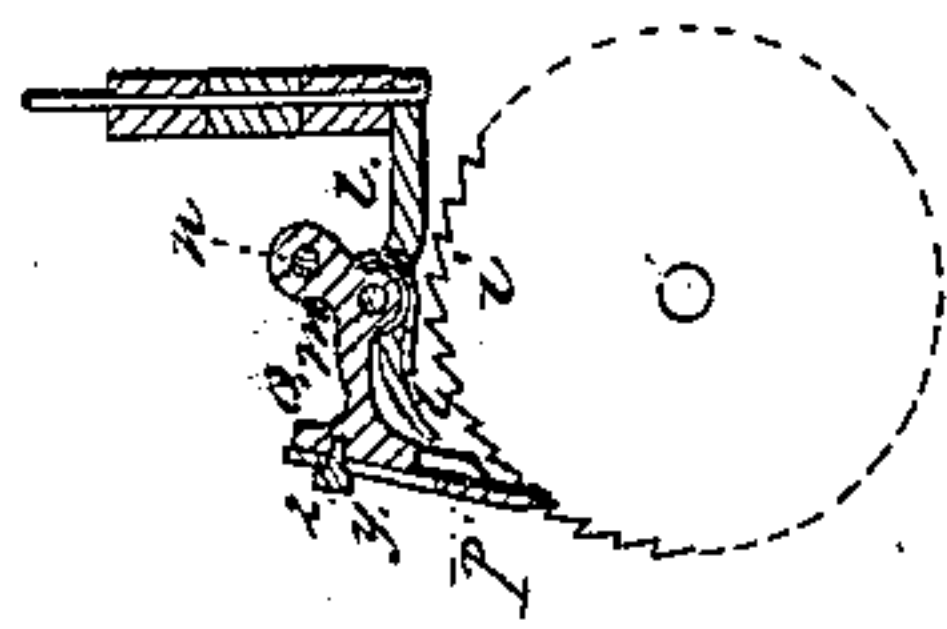
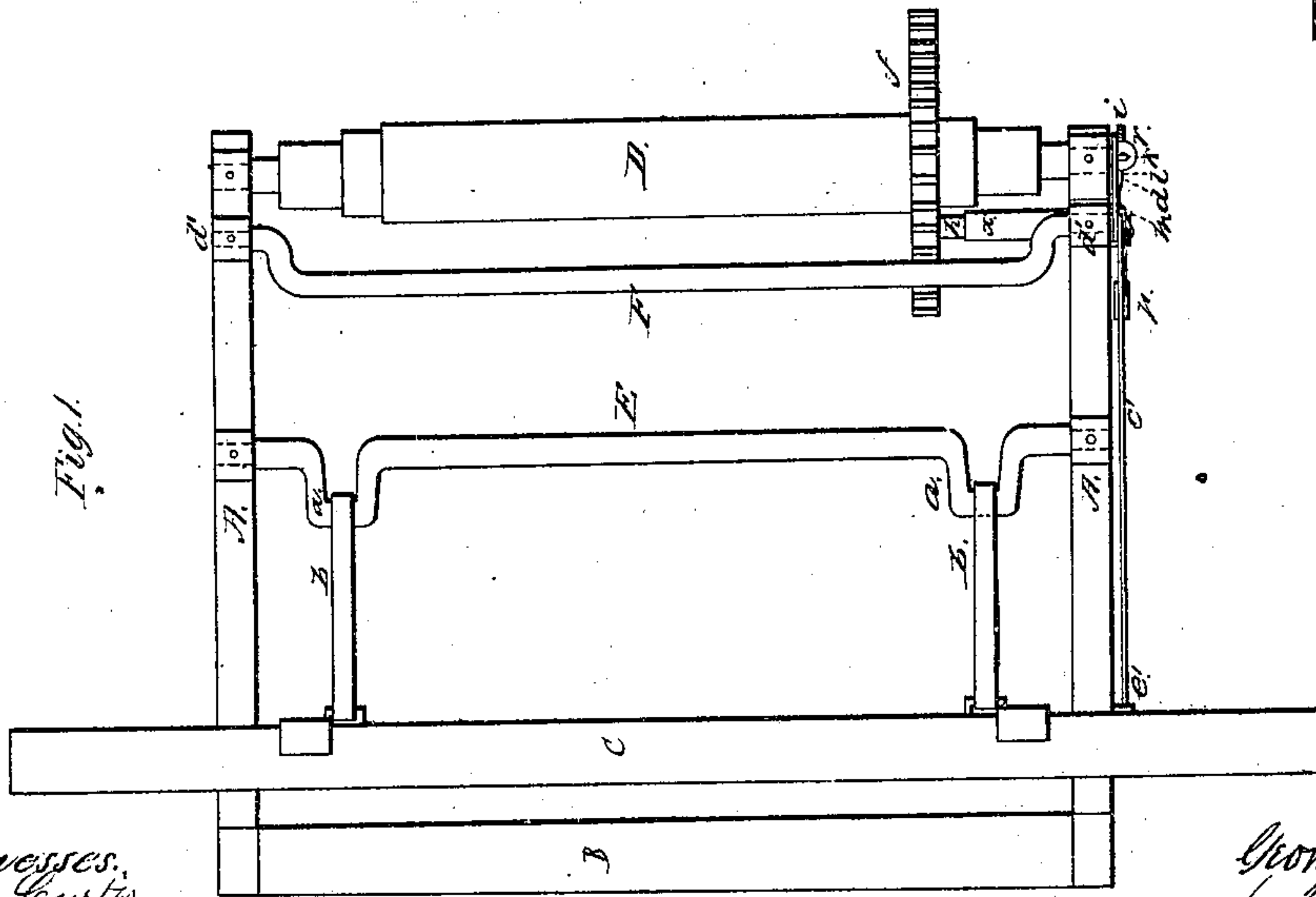


Fig. 1.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN YARN-DELIVERING MECHANISM FOR LOOMS.

Specification forming part of Letters Patent No. 41,834, dated March 8, 1864.

To all whom it may concern:

Be it known that I, GEORGE DRAPER, a resident of Milford, in the county of Worcester and State of Massachusetts, have invented a new and useful Yarn-Delivering Mechanism for a Loom for Weaving; and I do hereby declare the same to be fully described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 is a top view, and Fig. 2 an end elevation, of my said invention, as applied to the yarn-beam and sundry other parts of a loom—that is, those with which it is most intimately connected. Fig. 3 is a vertical section, not only of the gravitating catch and the arm which carries it, but of the lever-pawl directly under it, they being hereinafter described. Fig. 4 is a cross-section of the loom, it being taken in a plane between the yarn-beam and the cranked shaft of the lay, and so as to represent the ratchet and other portions of my yarn-delivering mechanism. Fig. 5 represents another of the modes in which I have contemplated the application of that principle of my invention or that character by which it may be distinguished from others for similar purposes.

The nature of my invention, in part, as hereinafter described, is a combination of mechanism consisting of a ratchet, a pawl, an arm or lever, and a gravitating catch, a weight, and a mechanism or device by which the said arm of the gravitating catch and the said pawl are operated by the said weight and by certain mechanism of the loom in manner substantially as hereinafter described.

Furthermore, with my said mechanism I have combined a stopping mechanism to be operated by the lay, while the latter may be in the act of “beating up” or driving a filling or weft thread close up into the warp or to the woven cloth during the process of and for the purpose of weaving cloth. This additional mechanism and the mechanism hereinbefore referred to constitute a combination, not only novel, but very useful in many respects. In a patent recently granted to me I have represented this additional mechanism, or its mechanical equivalent, in combination with an “escapement” detent-lever, its wheel, and certain apparatus for operating such detent-lever, the object of the stopping mechanism being to prevent the beat of the reed of the lay against

the cloth from operating to cause the let-off mechanism to deliver yarn from the yarn-beam faster than may be desirable in the process of weaving, the said stopping mechanism not only completely arresting the action of the let-off mechanism at the period of the beating of the reed against the woven cloth, but on recession of the lay permitting the said let-off mechanism to be operated by the strain of the warps and cloth.

It should be borne in mind that the mechanism with which the stopping mechanism is combined is not an escapement let-off or delivery mechanism in which an escapement-wheel and a detent-lever furnished with two pallets constitute a material part, as in my apparatus or mechanism no such escapement-wheel and detent-lever are employed, as I make use of a simple ratchet with two pawls, and by such attain advantages not incident to the escapement let-off mechanism. In fact, not only is my apparatus different in its construction, but differs in its operation with respect to the “escapement let-off mechanisms” now in use, these differences serving to produce a better delivery of the yarn, as well as a nearer approach to the attainment of uniformity of tension of the warps.

In Figs. 1 and 2 of the drawings, A denotes a loom-frame of the ordinary kind, while B is the breast-beam, C the lay, and D the yarn-beam, thereof. The cranked shaft for operating the lay is shown at E as having its bell-cranks *a a* connected to the lay by two pitmen, *b b*. In their passage from the yarn-beam D to the reed and breast-beam the warps pass over and upon a guide, F, which is a long cranked rod, whose journals are supported within the opposite standards, *d' d'*, of the frame, such guide being so formed that while the warps may be passing across it the pressure of the warp upon it, induced by the take-up mechanism and the operations of the lay, shall cause the guide to turn, so as to impart motion to an arm, *d*, carried by and extending from one of the journals of such guide, as shown in Figs. 1 and 2.

A gear, *f*, affixed on the shaft of the yarn-beam, engages with a pinion, *g*, applied and fastened to the inner end of a short shaft, *h*, on whose opposite end there is affixed a ratchet, *i*, the said shaft *h* being supported by and so as to be capable of freely revolving within a

standard, *x*, projecting upward from one of the girts or cross-bars of the loom-frame.

From the arm *d*, and at or near its outer extremity, a rod, *k*, depends, such rod, at its lower part, being jointed or hinged to the outer end of a pawl or lever-pawl, *l*, which in Fig. 2 is represented as jointed or hinged at or near its middle to an arm, *m*. (Shown separately in side view in Fig. 6.) The said arm *m* is supported at or near one extremity of it on a stud or fulcrum, *n*, projecting from the loom-frame; and, furthermore, the arm is constructed with a cross-head, *o*, arranged at an obtuse angle with it and applied to its opposite end, the same being as shown in Fig. 6. This head serves to carry and guide a gravitating catch, *p*, which is to be so applied to the head as to be capable of freely sliding upward and downward thereon and relatively to the periphery of the ratchet *i*, with the teeth of which the catch is to operate.

The gravitating catch is made with a slot, *y*, to receive a screw or pin, *z*, which passes through the slot and enters and is fixed in the head of the arm *m*, the head of the pin, by overlapping the slot, serving to keep the gravitating catch in conjunction with the arm. The catch should be capable of playing loosely upward and downward on the said pin, and when elevated to its highest position the catch is estopped by the lower end of the slot, the upper end of the slot likewise serving to stop the catch when it may be at its lowest position on the head of the arm.

There is a weight or series, *r*, of weights strung on or affixed to the rod *k*. The ratchet *i*, the pawl *l*, the arm *m*, the gravitating catch *p*, and the weight *r*, arranged together and combined with the guide *F* and the yarn-beam, by means substantially as herein described, constitute my new yarn-delivering mechanism. In Fig. 5 the several parts of such a yarn-delivering mechanism are represented under a somewhat different arrangement and construction, the parts of such figure which correspond with those represented in Fig. 2 being denoted by like letters of reference, the main differences in construction and arrangement being as follows—that is to say: The lever-pawl *l*, instead of being above the ratchet *i* and hinged to the arm *m*, is placed beneath the ratchet, is supported on a stationary pin or fulcrum, *s*, and has a weight, *t*, or its equivalent, applied to it to force it up into contact with the periphery of the ratchet. The rod *k* passes down through the arm *m* and the pawl *l* or projections therefrom, and so as to be capable of sliding freely through them. There are buttons *v v* fixed on the rod *k*, one of these buttons being directly underneath and close to the arm *m*, while the other is directly over and close to the pawl *l*, the whole being as shown in Fig. 5.

The pressure of the yarn on the guide *F* tends to depress it, and thereby raise or move the arm *d*, in which case the arm *m* and the

gravitating catch *p* will be raised so as to elevate the said catch out of action with a tooth of the ratchet, and otherwise move it in such manner as to allow it to slip into action with a succeeding tooth or over one or more succeeding teeth and into action with the tooth immediately following the same. At the same time the pawl *l* will be brought into action with the ratchet to prevent it from being revolved. On retreat of the lay from the woven cloth the weight *r*, by its gravitating power, will cause the pawl *l* to be thrown out of engagement with the ratchet, which having taken place, the latter and the yarn-beam will be revolved until brought to a stand by the gravitating catch, which will be forced upward on its pin until the lower end of the slot of the catch comes into contact with the pin. In this way the yarn-beam will be made to deliver its yarn, and in such manner as to cause the tension on the warp to be uniform as well when the beam may be full as when it may be nearly empty of yarn.

In combining with the said yarn-delivering mechanism a stopping mechanism of the nature hereinbefore described, I extend downward from one of the journals of the yarn-guide *F* or from the heel of the arm *d* another arm, *a'*, which I connect to another vibratory arm, *b'*, applied to one end of the loom-frame and arranged with respect to the lay as shown in Fig. 2, by means of a connecting rod, *c'*, jointed to both arms. To the lay a projection, *e'*, is affixed and extended therefrom, as shown in Fig. 2.

From the above it will be seen that when the beat of the lay takes place against the cloth the projection *e'*, the rod *c'*, and the arm *b'* will operate to hold the yarn-guide *F* firmly in position and prevent it from being depressed by the strain on the warps, caused by the beat of the lay. Such depression, if allowed to take place, would be likely to create more or less action of the yarn-delivering mechanism, whereby the yarn would be delivered out of time.

I claim—

1. My said yarn-delivery mechanism or combination, substantially as described, the same consisting of the ratchet *i*, the pawl *l*, the arm *m*, the gravitating catch *p*, and the weight *r*, or their mechanical equivalents, combined with the guide *F* and the yarn-beam, substantially in manner and so as to operate as hereinbefore specified.

2. The combination therewith and with the lay, in the manner substantially as described, of the stopping mechanism, to operate as and for the object hereinbefore explained.

3. The gravitating catch and its arm or carrier, to operate together and with the ratchet, substantially as specified.

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